DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING ORGANISES A 3-DAY IEEE CONFERENCE ON

"IOT FOR RURAL HEALTH" (CIRH-2021)

Day-1: Report

The Department of ECE organized a 3-Day IEEE Conference on **"IoT for Rural health"** (CIRH-2021). Three tracks with six tutorials were proposed during the proceedings as part of the event on Day-1, 16th December 2021.

Track-1, First Tutorialtitled "**Descriptive and Diagnostic Analysis using Power BI**"by Mr.BhavaniShankar, which was an extended talk for about six hours and was held in MPMC Lab, H-block of the varsity. Dr.Sharad Kumar Tiwari gave opening remarks on the importance of data and its visualization. The Resource Person,Er.Bhavani Shankar spoke aboutthe necessity of data visualization and its requirement for the advancement of technology. He also deliberated on current trends in technologies,such as web, e-business, digital marketing, digital business, and how the present-daybusiness has gained prominence and autonomous stature with the help of data storage, visualization, and IoT. Er.Bhavani Shankar also mentioned how the sensors andIoTare going to help in data processingthat wouldenhance the automizingof machines. The hands-on trainingwas organized byEr.Bhavani Shankar and his team introduced "Power BI visualizing the data". All participants were engrossed to learn Data Visualization through which stored data could be used for product and solutions

development.

The Second Tutorial, a talk on "**Wireless connectivity in IoT**"by Er.N.Venkatesh and his Team. Er.N. Venkatesh,Sr.Director, Silicon Labs, Hyderabad shared his expertise on the Structure of IoT-connected devices, wired and wireless connectivity in IoT, and its special requirements for online. And also,he discussedthe License-free LSM Bands, operational range, causes of signal degradation, and network topologies like Star, Mesh, Peer to Peer, etc. He explained wireless protocols such as BT-LE,

BT classic, ZigBee, WLAN (Wi-Fi), and 4G, 5G, Lora,Z-Wave, and their applications.

Ms. Yamini Sri Kolluru, Er. N. Venkatesh's team member explained how to build the IoT Device that also includes a product called "EFR32xG21 wireless SoC" used to connect various sensors. There was an introduction to many software components of IoT solutions like AWS/AZURE/Alibaba cloud, Wifi driver, TCP/IP stack, Bluetooth stack, simplicity studio. Ms. VenkataChandiniBhanavathudemonstratedcreating an IoT application, application code flow, BLE use, and final execution. Students actively interacted during the session.

The ThirdTutorial was on**"Invented for life"**byMr.HariharanSethuraman, Business Domain Head-Healthcare, Robert Bosch, Coimbatore. Hetold that the Pathologist and Rural Pathologise simpler devices and results are attained very fast.Like Viva,Ray equipment is used to check a person suffering from Anemia also discussed othersimple, time-saving, and faster result-oriented electronic equipment inspired participants to get innovative ideas.

Mr.Yoram Segal delivered the Fourth Tutorial organized on **"Deep Learning for Medical Therapies based on Movement"**. He talked about the Skeletalization of a person and algorithm moves in the subject, resembling the original movement of the professional.He mainly explained sixPhysiotherapy exercises and Telehealth Goals. He also discussed regarding development of genericTelehealth-based standard equipment. The major objective of this topic was to knowtagging, analyzing, measuring, and clarifying the human movements and converting them into text, which further helps in analyzing the movements and therapies that could easily be given.

The Fifth Tutorial was organized on **"Unmanned Aerial Vehicles" (UAVs)**. It was an offline session and Dr.G.V.V.Sharamadeliberated on drones and toy cars. He discussed FPGA, which is going to be used more frequentlyinthe coming days,and also discussed the Unmanned Aerial Vehicle (UAV) and Unmanned Ground Vehicle (UGV) which can be termed as Automatized vehicles.They can be operated by phones

and laptops.

Dr.Sanjeev Kubakaddi delivered Sixth Tutorial on **"Innovation in Health Care"**. Dr. Sanjeev Kubakaddidiscussed spoke about the top 10 trends and innovations in 2021 and briefed about the top 10 trending technologies. He discussed the top trends growth rate and mobile,health and its importance in pandemic for measuring saturation rates and oxygen levels. One of the trends thatwere observed was data analytics performance in the integration of primary health care Centres, tertiary hospitals, and district hospitals were discussed.He highlighted the innovations in medical and biological engineering fields then trends in innovation in biomedical equipment decade-wise. Further to this, he marked the

importance of transmission of physiological signals like EEG,EMG,ECG, etc. in telemedicine andabout AI Software, whichcan easily be recognized and diagnosed to find out the impact of Pneumonia and lung disease in the chest X-Ray.

DAY-2:Report

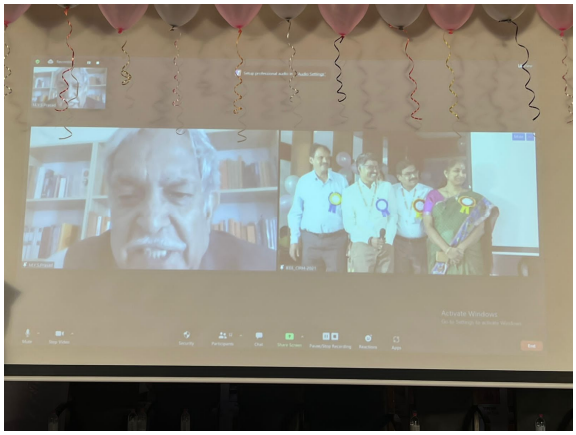
On 17th December 2021, the Department of Electronics and Communication Engineering, Vignan's Deemed to be University organized an IEEE conference on ***"IoT for Rural health care"(CIRH-21)***.

The inaugural ceremony of the event commenced with the lighting of the lamp by the group of dignitaries. Sri. D. Rama Krishna, Chair, Dr. N. Usha Rani, Guntur Sub-Section, Dr. T. Pitchiah, (HoD of ECE, VFSTR), Dr.G.Srinivasa Rao Dean, R&D,VFSTR, Dr.S.V.N.Lalitha, Chair,IEEE Guntur Sub-Section, Dr.Jakeer Hussain, Deputy HoD, VFSTR, Dr.Ravi Sekhar, Professor, VFSTR, Dr.N.V.R.Vikram, Professor,VFSTR, welcomed all the dignitaries present on the dais and delegates from various institutions.The dignitaries informed the significance of IEEE and its aim to spread awareness among students on trending technologies in the current scenario; they also briefed about the importance of the topics by

esteemed resource persons.

The Chief Guest of the IEEE Conference (CIRH-2021),Prof.P.Chakrabarti,Director,IIEST Shibpur, IIT Varanasidelivered the inauguraladdress and also took part in the Plenary Talk on ***"Recent advancement on Technologies".***He described that the main aim of 'Descriptive Technologies' and opportunities for opening 'Start-ups'is to strengthen ourselves and the economy of our country on the whole. Further, he stated that the technology is going to be more advancedfrom now onwards even if it ruins an Industry.He remarked that the 'New Innovations' will eventually create a new platform and galore of opportunities in the industry. Such Start up's usually emerge out of these kinds of innovations. At last, he concluded that one must be prepared enough to face failures in one's life and learn from the same and disruptive innovations are certainly opening mega opportunities for the start-ups.

In the second session, Dr. M. Y. S. Prasad, Former Director, SHAR, Sriharikota while participating in the plenary session on ***"Role of Satellite Technologies in Rural Health Care"***talked about the basic



elements of Automatic System, ASLV at ISRO, Control System elements and propellant filling at ISRO.

Later in the day,the Keynote Talk on ***"Advanced Textiles for energy, Sensing and Healthcare"*** was delivered by Prof. Jose Rajan from Industrial Science and Technology, University Malaysia Pahang***.*** Hediscussed the sustainability issues, electro-spinning of Nanofibers, and advanced materials.

Another keynote was addressed by Prof.OferHadar, Ben Gurion University Israel on ***"Risk of Cyber Security using***

IoT devices,especially in Medical application" while speaking to the audience he explained the risks of patient'sprivacy, Accidental failures, malware attacks, and lack of encryption.

Track-1: There was an organized invited talk on ***"Sensors & Edge Devices"*** by Mr.Dinesh Chand Sharma. The title of the topic is ***"e-Healthcare:Standards Perspective"***. He gave the participants a clear idea on WHO, the role of technology in health care (IoT), Artificial Intelligence (AI), Initiatives: E-Health.

Track-2: There was an invited talk on ***"Communication Technologies"*** by Dr. Sanjay Kimbahune, Sr. Research Scientist, TCS. The topic is ***"IoTsfor rapid screening of cardiovascular issue and wireless sensing note for Rapid E-Coli Detection".***Dr. Sanjay Kimbahune discussed the Cardio-vascular issue by observing the problems faced during covid-19. He said that this IOT domain helps in solving issues throughthe interventionofcommunication technologies.

Track- 3: The title of the talk was***"Analytics contextual algorithms and Applications"*** by Er. N. Venkatesh.

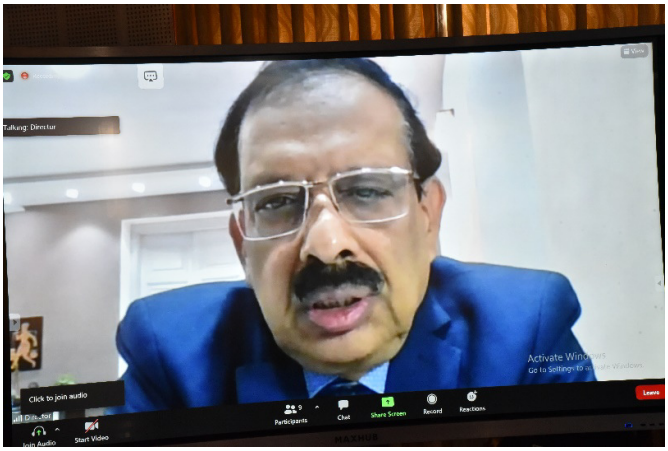
He delivered the keynote address on ***"Technology in the IoT***". During the talk, he discussed sensors that are used in IoT and explained their fusion and signal conditioning. He described the emerging areas and challenges in the future. He also explained how we canfuse sensors that could work with the help of the cloud and connect easily with IoT. During the session,explained career prospectsin the field of IoT and sensors.

Track- 4: Dr.N. Usha Rani started her talk on ***"The Role of ML in Medical Diagnosis and Applications of ML in Health care"***.ML can be usedforpredicting disease progression and data analysis such as Detection of regularities, Interpretation of continuous data, and Intelligent alarming.
There are avariety ofapplications of ML, such as Imaging & Diagnosis, Easier Cancer treatment, and Medical Imaging. The Equipment is used in medical imaging is CT, MRI, X-Ray, ultrasound, etc. Based on the functions of the organ, the particular equipment is chosen. She also discussed energy sources-imaging modalities. She said that Machine Learning is of 2 Types i.e., Supervised Learning and Non-Supervised Learning and Machine Learning considers Dataset in two phases of Training and Predicting.

Track-5: Laterin the day,the Keynote was delivered by Dr.Santanu Das on ***"Two-Dimensional Hybrid Materials for Functional Applications: New Archetypes of Nano-Scale Engineering"***He introduced Nanomaterials and recent trends. The major applications of it are nanorobots, memory, and nanomedicines as these are less than a nanometer in size. Then he introduced current research that focuses on the study of the synthesis, structure-function relationship, and applications.

Thereafter, ECE Department students did poster presentations followed by an enthralling heart-warming entertainment program in the evening by the varsity cultural club.

The graceful presence of guests intrigued positive vibes among faculty, students, and participants of the conference.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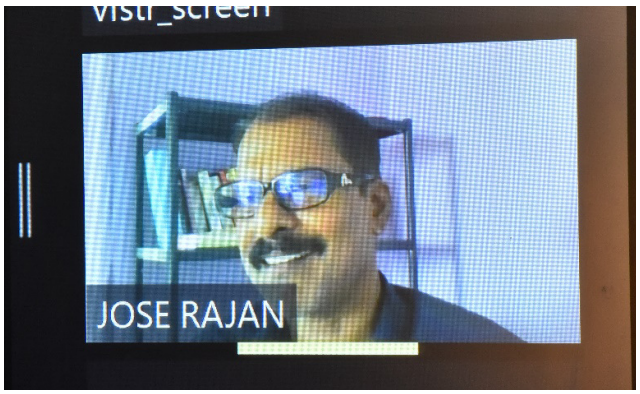
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Rural Health Care

Day-3: Report

On 18th December 2021, the Department of Electronics and Communication Engineering, Vignan's Deemed to be University organized IEEE conference on ***"IoT for Rural health care"(CIRH-21)***.

A Keynote talk was held that was delivered by Prof.Sarah Kurtz on the topic ***"Seeking a Clean Energy System at a Lower Cost"***. She envisioned a goal on Clean and low-cost renewable energy 'plus'. This paves the path to low-cost energy system.She discussed the top three elements which provide renewable energy enhancing techniques. She also explained by giving live examples on 'Price Vs Energy graph'on Solar and how it has grown much faster than expected. Within a short span of a decade Solar technology has grown in manifold usage across the globe and thus showing significant signs of growth.

Later in the day, Prof. Brahmjit Singh delivered a talk on ***"IoT and its synergy with Machine Learning"***. He described some Disruptive Technologies like AI, Blockchain, etc., and various applications in IoT. He took up Global worth, Vision, and salient features of IoT. He discussed the Frame- Work of an IoT, Wireless technologies for IoT. And also, he explained ML algorithms, supervised and unsupervised learning with examples. Later he discussed Artificial Neural Network (ANN) and the importance of Deep Learning. At last, he briefed the characteristics of IoT and ML.

Track-1: Communication Technologies

Prof Ravi Sekhar delivered an invited talk on ***"6G communication and its vision technology integration with society sustainable development Goals"***.He discussed the history of the cellular road map and introduction of 5G and its importance of it, requirements of 5G, the main factor to build 5G communication is latency. He also deliberated how 5G is different from other network. He gave an introductionto 6G expecting anytimeany place network vision of 6G connecting the physical, digital, human world and along with the key values of 6G's sustainability and inclusion of requisite measures by companies

Track-2: Analytics, Contextual Algorithms & Applications

An invited talk was organized on ***"Big data Processing and Artificial Intelligence at the network edge".***Ms.SurabhiSaraswatdescribed that computing is a new approach to network architecture that has left behind cloud computing and it places the intelligence for processing the data. The overall aim is to boost the development of edge frame and AI-empowered software systems that are capable of Big data processing that supports sovereignty and privacy.

Track-3: Intelligence

An invited talk was organized on ***"Application of IoT across the Industry and Healthcare***"Mr.Bala Prasad Peddigiridelivered the talk. He discussed Edge Computing and its importance, Edge Topology;required components for Edge Computing, operational technology, Intelligent Edge. Later, he discussed the benefits and value and Edge Architecture Smart Pharma. At last, he elaborated the benefits of Edge Computing in Health Care.

Track-4:Miscellaneous

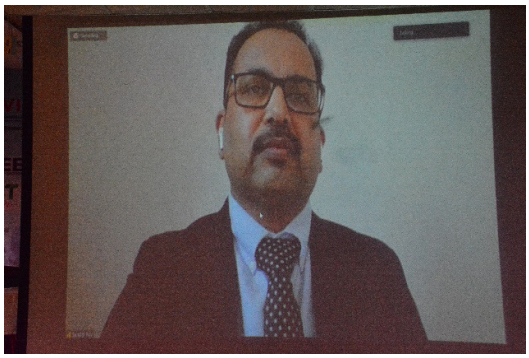
An invited talk was organized on the ***"Role of Thin Films in Healthcare"***byDr.NVRVikram G. He discussed regarding drug delivery and bionic eyes. Further, he stated about the process of treatment and diagnosis system on the whole.

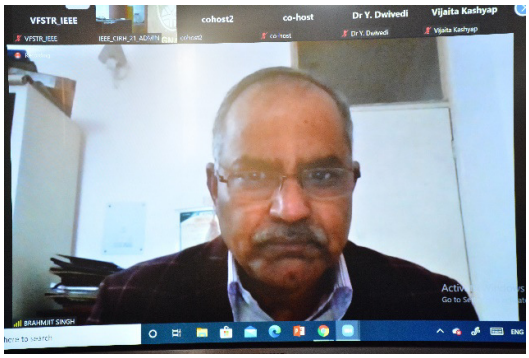
A Keynote talk by Dr. Kensuke Takechwas heldon the title, "Recent Progress, Applications, and Perspectives of Material Informatics". He described organic materials and reciprocal 3D Voxel Space (R3DVS). He explained the supervised learning Material Informatics which are highly efficient for screening methods.

Dr. Sandeep Roy, a Keynote speaker delivered a talk on the "***Global Covid 19 vaccines supply to the rural area using IoT-based cold chain monitoring***". He discussed on high demand for ultra-cold storage facilities due to the huge population and smart supply chain. The main objective of this talk was to discuss on supply of vaccines without breaking the cold chain system at delivering end. Later, he discussed the IoT-based cold chain monitoring system in one of the case study real-time evaluation IoT-basedsystems in the supply chain. In one such case study,he spoke about providing insulin to a diabetic patient, AdaBoost algorithm for diabetics, smart storage system RTA. At last, he explained the Covid vaccine supply challenges,technologies,solutions,apps, and features of some of the optimization methods.

Later in the day, a panel discussion was organized in which Er. Dasari Ramakrishna, Effectronics discussed the importance of IoT. He said that IoT played an important role in Medical Instruments in Pandemic. Dr. PramodChalasani who is working as a Neurologist at Latha Super Speciality Hospital conveyed that IoT plays a major role in Medical applications. Dr. Murali Krishna, Surgical Oncologist, Mahatma Gandhi Cancer Hospital and Research Institutediscussed the importance of Telemedicine and how IoThelped in Pandemic for contactless treatment Dr. Dharmendra, discussedon fast analysis of reports within minutes instead of hours by using IoT.

The event ended with a vote of thanks by Dr.RaviSekhar to all the dignitaries, HoD of the ECE Department, Dr. Usha Rani, and all the student volunteers.

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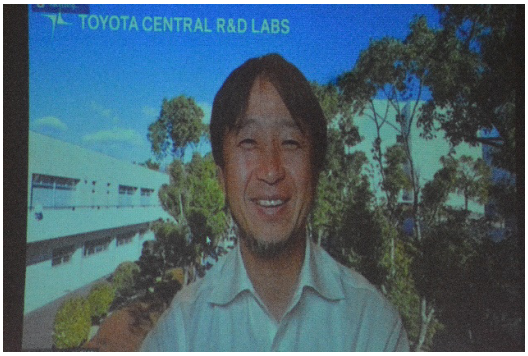
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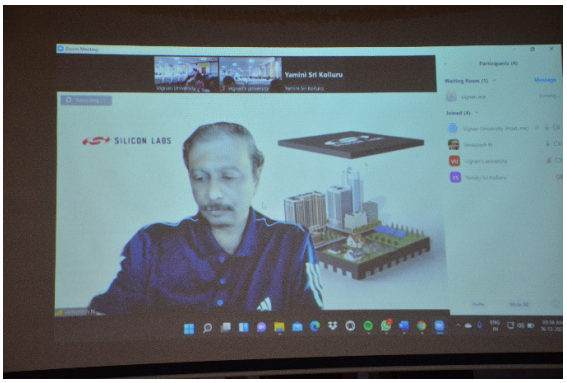
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AWS IoT Setup
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